

## ABSTRACT OF THE DISCLOSURE

A system for manipulating optical signals in an optical switch utilizes a piezoelectric membrane. The membrane is selectively enabled to switch among an outward position, an inward position and a relaxed orientation in relation to a sidewall of a trench that is provided as part of the switch. The membrane is in fluidic communication with an intersecting gap of the trench that crosses a first input waveguide and a first output waveguide. Displacing the membrane to a first position causes the gap to be filled with an index-matching liquid such that light from the first input waveguide is transmitted to the first output waveguide. Alternatively, displacing the membrane to a second position causes the gap to be filled with a gaseous bubble, resulting in a refractive index mismatch, such that the light from the first input waveguide is diverted at the gap. In another embodiment, there are two membranes utilized for manipulating optical signals.

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